What is claimed is:

Sub C1

1. An conductive system comprising:

a substrate;

a foamed material layer on the substrate, the foamed material layer having a surface that is hydrophobic; and

a plurality of conductive structures embedded in the foamed material layer.

2. The conductive system of claim 1, wherein the foamed material layer has a foamed thickness of between about .4 microns and about 3.4 microns.

3. The conductive system of claim 1, wherein the foamed material layer has a dielectric constant of between about 1.2 and about 1.8.

4. The conductive system of claim 1, wherein the foamed material layer is a foamed polymer layer.

5. The conductive system of claim 1, wherein the foamed material layer is a foamed aerogel layer.

6. An conductive system comprising:

a substrate;

a foamed material layer on the substrate, the foamed material layer having a surface that is hydrophobic and a cell size of less than about one micron; and

a plurality of conductive structures embedded in the foamed material layer.

7. The conductive system of claim 6, wherein the plurality of conductive structures embedded in the foamed material layer are conductive circuit lines.

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8. The conductive system of claim 6, wherein the foamed material is a foamed polymer.

9. The conductive system of claim 6, wherein the foamed material is a foamed polyimide.

10. The conductive system of claim 6, wherein the foamed material is a foamed polymer containing silane.

11. The conductive system of claim 6, wherein the cell size is less than about .1 micron.

12. An integrated circuit structure comprising:

a substrate;

a plurality of stacked foamed polymer layers on the substrate, each of the stacked foamed polymer layers has a surface that is hydrophobic, and each of the foamed polymer layers has a cell size less than about one micron; and

a plurality of conductive structures embedded in each of the plurality of foamed polymer layers.

13. The integrated circuit structure of claim 12, wherein a minimum distance between the plurality of conductive structures has a value, and the cell size is less than the value.

14. The integrated circuit structure of claim 12, wherein the cell size is less than about .1 micron.

15. The integrated circuit structure of claim 12, wherein each of the plurality of stacked foamed polymer layers is fabricated from polyimide.

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16. The integrated circuit structure of claim 12, wherein each of the plurality of conductive structures is fabricated from an aluminum alloy.

17. The integrated circuit structure of claim 12, wherein each of the plurality of conductive structures is fabricated from a copper alloy.

18. A computer system comprising:

a processor;

a memory system coupled to the processor, the memory system is on a substrate and comprises a plurality of devices; and

an interconnect system comprising:

a foamed polymer layer having a cell size of less than about .1 microns, the foamed polymer layer on the substrate; and

a plurality of conductive structures embedded in the foamed polymer layer, and each of the plurality of conductive structures is capable of interconnecting at least two of the plurality of devices.

19. The computer system of claim 18, wherein the foamed polymer layer is parylene.

20. The computer system of claim 18, wherein the each of the plurality of conductive structures has a separation distance and the separation distance is less than about one micron.

21. A method of forming an insulator comprising:

forming a material layer having a material layer thickness on a substrate;

foaming the material layer to form a foamed material layer having a surface and a foamed thickness, the foamed thickness being greater than the material layer thickness; and

treating the surface to make the surface hydrophobic.

22. The method of claim 21 wherein forming a material layer having a thickness on a substrate comprises:

forming a polymer layer on the substrate.

23. The method of claim 21, wherein forming a material layer having a thickness on a substrate comprises:

applying an aerogel to the substrate;

spinning the substrate; and

curing the aerogel such that, after curing, the thickness is between about .6 microns and about .8 microns.

24. A method of forming an insulator comprising:

forming a polymer layer on a substrate;

foaming the polymer layer to form a foamed polymer layer having a surface and a foamed polymer dielectric constant between about .8 and about 1.0; and

treating the surface to make the surface hydrophobic.

25. The method of claim 24, wherein forming a polymer layer on a substrate comprises:

depositing polyimide containing silane on the substrate.

26. The method of claim 24, wherein foaming the polymer layer to form a foamed polymer layer having a surface and a foamed polymer dielectric constant between about .8 and 1.0 comprises:

forming a foamed polymer layer having a depth of between about 1.8 and 2.0 microns.

27. The method of claim 24, wherein treating the surface to make the surface hydrophobic comprises:

flowing methane radicals over the surface.

28. A method of forming an insulator comprising:

forming a polymer layer on a substrate;

foaming the polymer layer with a supercritical fluid to form a foamed polymer layer having a surface and a foamed polymer dielectric constant between about .8 and 1.0; and

treating the surface to make the surface hydrophobic.

29. The method of claim 28, wherein forming a polymer layer on a substrate comprises:

forming a polyimide layer on the substrate.

30. A method of forming an insulator comprising:

forming a polymer layer having a thickness on a substrate from a polymer having a silane additive;

foaming the polymer layer to form a foamed polymer layer having a surface and a foamed polymer layer thickness, the foamed polymer layer thickness is greater than the polymer layer thickness by a factor of about between about 2.8 and 3.2; and

treating the surface to make the surface hydrophobic.

31. A method of forming an insulator comprising:

forming a polymer layer having a thickness on a substrate from a polymer having a silane additive;

foaming the polymer layer to form a foamed polymer layer having a surface and a foamed polymer layer thickness, the foamed polymer layer thickness is greater than the polymer layer thickness; and

exposing the surface to a gas.

32. The method of claim 31, wherein exposing the surface to a gas comprises:

exposing the surface to methane.

33. The method of claim 31, wherein exposing the surface to a gas comprises:

passing a methane gas through a plasma to form a plurality of methane radicals; and

exposing the surface to at least some of the plurality of methane radicals.

34. A method of forming an insulator comprising:

forming a polymer layer having a thickness on a substrate from a polymer having a silane additive;

foaming the polymer layer to form a foamed polymer layer having a surface, a cell size, and a foamed polymer layer thickness, the foamed polymer layer thickness is greater than the polymer layer thickness, and the cell size ~~is less than~~ about one-tenth of a micron; and

exposing the surface to a gas.

35. A method of forming an insulator comprising:

forming an aerogel layer on a substrate, the aerogel layer having a surface; and

treating the surface to make the surface hydrophobic.

36. The method of claim 35, wherein forming an aerogel layer having a surface on a substrate comprises:

forming an aerogel layer having a cell size of less than one micron.

37. The method of claim 35, wherein forming an aerogel layer having a surface on a substrate comprises:

forming an aerogel layer having a cell size of less than one-tenth micron.

38. The method of claim 35, wherein treating the surface to make the surface hydrophobic comprises:

exposing the surface to methane radicals.

39. The method of claim 35, wherein treating the surface to make the surface hydrophobic comprises:

forming a plurality of methane radicals using a high frequency electric field; and

exposing the surface to at least some of the plurality of methane radicals.

40. A method of forming an insulator comprising:

forming an air-bridge structure having a surface on a substrate; and

treating the air-bridge structure to make the surface hydrophobic.

41. The method of claim 40, wherein treating the surface to make the surface hydrophobic comprises:

forming a plurality of methane radicals using a high frequency electric field; and

exposing the surface to at least some of the plurality of methane radicals.